Name: Date:

Polynomial Factoring solution (version 44)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 12x + 63 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(63)}}{2(1)}$$

$$x = \frac{-(12) \pm \sqrt{144 - 252}}{2(1)}$$

$$x = \frac{-12 \pm \sqrt{-108}}{2}$$

$$x = \frac{-12 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{-12 \pm 6\sqrt{3}\, i}{2}$$

$$x = -6 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 + 6i$ and $-7 + 5i$ in standard form $(a + bi)$.**

Solution

$$(-2 + 6i) \cdot (-7 + 5i)$$

$$14 - 10i - 42i + 30i^2$$

$$14 - 10i - 42i - 30$$

$$14 - 30 - 10i - 42i$$

$$-16 - 52i$$

Polynomial Factoring solution (version 44)

3. **Write function $f(x) = x^3 + 6x^2 - 4x - 24$ in factored form. I'll give you a hint: one factor is $(x + 2)$.**

Solution

	1	6	-4	-24
-2		-2	-8	24
	1	4	-12	0

$$f(x) = (x + 2)(x^2 + 4x - 12)$$

$$f(x) = (x + 2)(x + 6)(x - 2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 4)^2 \cdot (x - 1) \cdot (x - 5)^2$$

Sketch a graph of polynomial $y = p(x)$.